

IN THE CLAIMS

1-29. (canceled)

30. (new) A control system comprising:
a linear controller that outputs a first
signal;
a first multiplier having a first input coupled
to receive the first signal;
a first summer having a first input coupled to
an output of the first multiplier;
a scaler having an input coupled to an output
of the first summer;
a first delay having an input coupled to an
output of the scaler and an output coupled to a second
input of the first summer, the output of the first delay
providing a second signal that is a square root of the
first signal;
a second multiplier having a first input
coupled to the output of the first delay;
a second summer having a first input coupled to
an output of the second multiplier and a second input
coupled to a constant;

a third multiplier having a first input coupled to an output of the second summer and an output coupled to a second input of the first multiplier;

a second delay having an input coupled to an output of the third multiplier and having an output coupled to second inputs of the second and third multipliers; and,

a non-linear instrument coupled to receive the second signal, wherein the second signal is a pre-distorted form of the first signal such that the non-linear instrument provides a linear output with respect to the first signal.

31. (new) The control system of claim 30 wherein the scaler applies a scaling function substantially equal to one-half.

32. (new) The control system of claim 30 wherein the constant is substantially equal to two.

33. (new) The control system of claim 32 wherein the scaler applies a scaling function substantially equal to one-half.

34. (new) The control system of claim 30 wherein the first input of the first summer comprises a first positive input, wherein the second input of the first summer comprises a second positive input, wherein the first input of the second summer comprises a negative input, and wherein the second input of the second summer comprises a positive input.

35. (new) The control system of claim 34 wherein the scaler applies a scaling function substantially equal to one-half, and wherein the constant is substantially equal to two.

36. (new) The control system of claim 30 further comprising a sign restorer, wherein the sign restorer comprises a signal extractor, a third delay, and a fourth multiplier, wherein the sign extractor provides a sign of the first signal, wherein the third delay imposes a delay on the sign, and wherein the fourth multiplier has a first input coupled to an output of the third delay and a second input coupled to the output of the first delay, and wherein the fourth multiplier has an output coupled to the non-linear instrument.

37. (new) A control system comprising:

a first multiplier having a first input coupled to receive a first signal;

a first summer having a first input coupled to an output of the first multiplier;

a scaler having an input coupled to an output of the first summer;

a first delay having an input coupled to an output of the scaler and an output coupled to a second input of the first summer, the output of the first delay providing a second signal that is a square root of the first signal;

a second multiplier having a first input coupled to the output of the first delay;

a second summer having a first input coupled to an output of the second multiplier and a second input coupled to a constant;

a third multiplier having a first input coupled to an output of the second summer and an output coupled to a second input of the first multiplier;

a second delay having an input coupled to an output of the third multiplier and having an output coupled to second inputs of the second and third multipliers; and,

a non-linear instrument coupled to receive the second signal, wherein the second signal is a pre-distorted form of the first signal such that the non-linear instrument provides a linear output with respect to the first signal.

38. (new) The control system of claim 37 wherein the scaler applies a scaling function substantially equal to one-half.

39. (new) The control system of claim 37 wherein the constant is substantially equal to two.

40. (new) The control system of claim 39 wherein the scaler applies a scaling function substantially equal to one-half.

41. (new) The control system of claim 37 wherein the first input of the first summer comprises a first positive input, wherein the second input of the first summer comprises a second positive input, wherein the first input of the second summer comprises a negative input, and wherein the second input of the second summer comprises a positive input.

42. (new) The control system of claim 41 wherein the scaler applies a scaling function substantially equal to one-half, and wherein the constant is substantially equal to two.

43. (new) The control system of claim 37 further comprising a sign restorer, wherein the sign restorer comprises a signal extractor, a third delay, and a fourth multiplier, wherein the sign extractor provides a sign of the first signal, wherein the third delay imposes a delay on the sign, and wherein the fourth multiplier has a first input coupled to an output of the third delay and a second input coupled to the output of the first delay, and wherein the fourth multiplier has an output coupled to the non-linear instrument.

44. (new) A control system comprising:
a first multiplier having a first input coupled to receive a first signal;
a first summer having a first input coupled to an output of the first multiplier;
a scaler having an input coupled to an output of the first summer;

a first delay having an input coupled to an output of the scaler and an output coupled to a second input of the first summer, the output of the first delay providing a second signal that is a square root of the first signal;

a second multiplier having a first input coupled to the output of the first delay;

a second summer having a first input coupled to an output of the second multiplier and a second input coupled to a constant;

a third multiplier having a first input coupled to an output of the second summer and an output coupled to a second input of the first multiplier;

a second delay having an input coupled to an output of the third multiplier and having an output coupled to second inputs of the second and third multipliers;

a fourth multiplier having first and second inputs and an output, the first input of the fourth multiplier being coupled to an output of the first delay, the second input of the fourth multiplier receiving a sign of the first signal, and the output of the fourth multiplier providing a third signal that is a square root

of the first signal and that has the sign of the first signal; and,

a non-linear instrument coupled to receive the third signal, wherein the third signal is a pre-distorted form of the first signal such that the non-linear instrument provides a linear output with respect to the first signal.

45. (new) The control system of claim 44 wherein the scaler applies a scaling function substantially equal to one-half.

46. (new) The control system of claim 44 wherein the constant is substantially equal to two.

47. (new) The control system of claim 46 wherein the scaler applies a scaling function substantially equal to one-half.

48. (new) The control system of claim 44 wherein the first input of the first summer comprises a first positive input, wherein the second input of the first summer comprises a second positive input, wherein the first input of the second summer comprises a negative

input, and wherein the second input of the second summer comprises a positive input.

49. (new) The control system of claim 48 wherein the scaler applies a scaling function substantially equal to one-half, and wherein the constant is substantially equal to two.